NASA Glenn Research Center
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Glenn and Cleveland State establish technology center

New center is a catalyst for growth and retention of technical expertise in Northeast Ohio.

On August 24, Cleveland State University (CSU), in conjunction with NASA Glenn, hosted a ceremony and reception at the CSU Convocation Center to announce the formation of the Center for Research in Electronics and Aerospace Technology (CREATE).

CREATE will bring applied scientists and engineers from Glenn, CSU, government, industry, and other organizations together to advance the state-of-the-art of power technology and introduce this technology into the private sector in Northeast Ohio.

"A key objective of CREATE is to establish and strengthen a Glenn, CSU, and industry collaboration in aerospace systems, consistent with Glenn's strategic goals and NASA's educational goal to develop the future generation of research scientists and engineers," said Dr. M. David Kankam, Glenn's University Affairs officer. "The industry and education component serve concurrently as catalysts for regional growth and retention of Ohio technology expertise."

Photo by William Rieter, CSU

Glenn Center Director Dr. Julian Earls, CSU Trustee Trevor Jones, and CSU President Dr. Michael Schwartz during the CREATE reception.

Housed in CSU's Fenn College of Engineering, the goals of CREATE are to (1) assist in maturing aerospace power system technologies to levels that show potential for commercialization, (2) disseminate knowledge from technology development activities in an efficient manner to effectively transfer the technology to the private sector, and (3) integrate these activities with the educational program so that students can gain hands-on experience from CREATE activities. Engineering faculty and students are expected to have numerous opportunities to participate in research on CREATE projects.

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Emission measurement testing will help aircraft fly cleaner

Glenn news release

The first and most extensive set of gaseous and particulate emissions data from an in-service commercial aircraft jet engine was obtained by a team of researchers from NASA, the Environmental Protection Agency (EPA), and the Department of Defense (DOD). This collaborative effort, called the Aircraft Particle Emissions eXperiment (APEX) Project, resulted in successful ground tests earlier this year at Edwards Air Force Base, CA.

APEX's main objective is to characterize gaseous and particulate emissions of NASA's DC–8 airplane and its CFM–56 engines to advance the understanding of particle emissions from commercial aircraft engines.

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Inside

Expedition 10 set to launch

BY S. JENISE VERIS

When the Expedition 10 (Exp.10) crew report for duty later this month, they will find the International Space Station "shipshape." Last month, Expedition 9 (Exp. 9) Commander Gennady Padalka and NASA Science Officer Mike Fincke conducted radio checks and performed the fourth and final spacewalk of their 6-month mission, which was critical to space station maintenance and assembly.

Expedition 10 crew, left to right, NASA Astronaut Dr. Leroy Chiao and Russian Comonaut Salizhan Sharipov.

Padalka and Fincke are slated to return to Earth aboard the Soyuz on October 18 after handing over command to Dr. Leroy Chiao, Exp.10 commander and science officer, and Russian cosmonaut Salizhan Sharipov, Soyuz commander and Exp.10 flight engineer. European Space Agency (ESA) astronaut Andre Kuipers, the third member of Exp. 9, returned earlier with Exp. 8 crewmembers Mike Foale and Alexander Kaleri after a brief stay to conduct experiments under a commercial agreement between Russia and the ESA.

Sharipov previously served as mission specialist on the STS–89 crew, which transferred 8000 pounds of scientific equipment, hardware, and water, and conducted the last exchange of a U.S. astronaut to *Mir*. Chiao, a veteran of three shuttle flights and former chief of the Astronaut Office Extravehicular Activity (EVA) Branch, has logged an extensive amount of EVA time—26 hours and 19 minutes spread over four spacewalks. During this mision, three more navigation antennas will be installed to prepare for the arrival of the new European Automated Transfer Vehicle, the *Jules Verne* cargo ship, scheduled for next year.

Many experiments from earlier expeditions remain onboard the space station and continue to benefit from the long-term research platform provided by the orbiting laboratory. Glenn's contributions to ongoing research include the following:

- **Space Acceleration Measurement System (SAMS) and Microgravity Acceleration Measurement System (MAMS)** sensors measure accelerations and vibrations caused by crew, equipment, and other sources that could disturb microgravity experiments.
- **Materials International Space Station Experiment (MISSE),** a collaborative suitcase-sized experiment mounted outside the space station, is exposing hundreds of materials to conditions in space, including 41 samples from the Glenn Polymer Erosion and Contamination Experiment (PEACE). These samples are being returned to Earth annually to analyze their durability and suitability for spacecraft construction.

Other Glenn-developed experiments currently onboard requiring crew time for maintenance and operation include the following Microgravity Science Glovebox experiments:

- **Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions (InSPACE),** a fluid physics experiment designed to learn more about magnetorheological fluids, new smart

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Center reaches small business utilization goals

Center Director Dr. Julian Earls attended the Annual Minority Business and Advocates Awards Ceremony, held September 9, to accept the Center's award for meeting all of the major small business goals negotiated for fiscal year 2003. Glenn was one of four out of NASA's ten field centers recognized for reaching that 100-percent milestone.

The event, sponsored by the Office of Small & Disadvantaged Business Utilization at Headquarters, recognizes businesses as Agencywide winners for Minority Contractor, Minority Subcontractor, and Woman-Owned Business of the Year, as part of Minority Enterprise Development Week.

Glenn's fiscal year 2004 award winners who were nominated for Agencywide awards include **N&R Engineering and Management Services Corporation (**Parma Heights), Dr. Vinod Nagpal, president and chief executive officer (CEO), Minority Contractor of the Year; **Paragon Tech** (Cleveland) Gail Dolman-Smith, president and CEO, Woman-Owned Business of the Year; **Dr. Michael Meador**, Polymer Branch, Technical Support Person of the Year; and **Virginia Bittinger**, Procurement Division, Procurement Support Person of the Year.

On July 15, Shirley Perez, program manager for Aeronautics, Office of Small & Disadvantaged Business Utilization, and Dr. Richard Wlezien, program manager for Vehicle Systems, Aeronautics Research Mission Directorate (both at Headquarters) participated in Glenn's 9th Small Disadvantaged Businesses (SDB) Forum and awards program, where Glenn's winners for fiscal years 2002 and 2003 were honored. For more information about Glenn's SDB Forum and award winners, visit http://www.grc.nasa.gov/WWW/Procure/SDBForum/SDB_Forum_Page.html. ◆

Pereira receives Silver Snoopy Award

William F. Readdy, former astronaut and associate administrator, Space Operations Mission Directorate, NASA Headquarters, presented a Silver Snoopy Award to Dr. J. Michael Pereira, Structural Mechanics and Dynamics Branch, on August 26. The surprise presentation took place during the Space Flight Awareness Honoree Awards in Orlando, FL.

Pereira was recognized for his expertise with ballistic impact testing in which he helped identify and characterize the complex mechanisms associated with the external tank foam impact on reinforced carbon-carbon orbiter leading edges on the space shuttle. His efforts proved essential in the Columbia accident investigation.

The Silver Snoopy Award is the astronauts' personal tribute to individuals whose single effort or long-term outstanding performance has contributed to flight safety and mission success—the main priorities for human space flight. The recognition focuses on efforts that enhance the probability of mission success, such as improvements in design; administration; technology; production techniques; business systems; flight and/or system safety; and error identification, correction, or prevention. ◆

Photo courtesy of NASA Johnson

Pereira, center, is pictured with Readdy, right, and Bob Cabana, astronaut and deputy center director of Johnson Space Center.

Station experiments

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materials that facilitate a rapid-response interface between mechanical components and electronic controls.

● **Coarsening in Solid-Liquid Mixtures-2 (CSLM–2)**, a materials science experiment to analyze the mechanisms and rate of coarsening, a process that degrades the strength of materials.

● **Binary Colloidal Alloy Test-3 (BCAT–3),** a long-term study documenting crystal formation or phase separation of fine particles (colloids) suspensed in liquids (such as paint, milk, or ink) in a microgravity environment, where the effects of sedimentation and convection are removed.

● **Capillary Flow Experiments (CFE),** a suite of fluid physics flight experiments investigating capillary flows and phenomena in low gravity. CFE data will be crucial to the Space Exploration Initiative for fluids management systems.

Glenn experiments waiting for the next appointed flight include an additional component of the CFE already onboard and the **Dust and Aerosol measurement Feasibility Test (DAFT).** DAFT is designed to test the effectiveness of the P-Trak™, a device that counts ultra fine dust particles. The DustTrak™ and custom-fill assembly will be characterized using a virtual impactor in a microgravity environment. A flight-hardened P-Trak™ will be used in the **Smoke** experiment slated for 2006.

In the meantime, the Glenn-designed electrical power system continues to power space station and light the way to new scientific discoveries. ◆

Two from Glenn graduate from Leadership Development Program

Wei-Yen Hu, Facilities Engineering and Architectural Branch, and Scott Thomas, Engine Systems Branch, were among the 19 members of the 2003–2004 Leadership Development Program (LDP) who celebrated the completion of their developmental year with a ceremony at NASA Headquarters on July 26. The program participants, who represented nine Centers, were the first graduates of the NASA LDP, which replaced the NASA Professional Development Program in support of the Agency's emphasis on improving leadership skills and effectiveness.

Photo by Bill Ingalls, NASA HQ

Hu, left, and Thomas, right, stand proudly with Deputy Administrator Frederick Gregory during the LDP graduation ceremony.

In his address to the graduates, Deputy Administrator Frederick Gregory thanked the participants for the contributions they had made to the Agency as part of their developmental assignments. He also praised them on the completion of their class project, "Achieving Mission Success in the 21st Century Through Collaboration." Gregory stated that he was particularly thankful and impressed that the class did not recommend the Agency take on a collaboration initiative, but rather they took what they learned about collaboration and infused it into existing initiatives and efforts such as One NASA, the Academy for Program and Project Leadership curriculum, and many other efforts. As a result of their project, the 2003–2004 class identified 75 collaboration best practices. A link to the full report of their findings and recommendations can be found on the LDP home page at http://ldp.nasa.gov/. ◆

Savings Bond Drive kickoff

Glenn's annual Savings Bond Drive kickoff offered an educational and entertaining time for employees on August 13. Guest speaker Michael Donnelly, former regional director of the Department of the Treasury, provided information on the benefits of purchasing savings bonds. Guest celebrity Markina Brown, a meteorologist for WOIO Channel 19, fielded questions from the audience on the local weather. The closing festivities featured over 50 door prizes donated by area vendors and trivia games led by Master of Ceremonies Dennis Pehotsky, Procurement Division. Civil servants can purchase savings bonds through payroll deductions. Pictured is Pehotsky with Brown.

Photo by Margaret Pehotsky

C-2004-1185 Photo by Michelle Murphy

Congressional staff visits

During an August 19 visit, congressional staff members learned about NASA Glenn's technical capabilities and how those competencies relate to the Agency's aeronautics mission and the National Vision For Space Exploration. The visit included a tour of the Electric Propulsion Laboratory, the Icing Research Tunnel, the Accoustical Testing Laboratory, and the Space Experiments Laboratory. Glenn staff also briefed the guests on key partnerships in the areas of education and technology commercialization, along with information on the Center's economic impact on the state and region. Congressional staff attendees represented Senator Mike DeWine, (R–OH), Senator Bill Nelson (D–FL), Senator Ted Stevens (R–AK), U.S. Congresswoman Stephanie Tubbs Jones (D–OH), and Congressman Tom Feeney (R–FL).

Shin Farewell

On September 1, NASA managers, colleagues, and friends reluctantly said goodbye to Dr. Jaiwon Shin, but wished him well without reserve. In May, Shin was appointed deputy associate director of the Aeronautics Research Mission Directorate at Headquarters. He was chief of Glenn's Aeronautics Projects Office and a much respected and esteemed member of the Glenn family for 15 years. During the reception, a series of presentations—sprinkled with pride and humor—showed just how much he will be missed here. Dr. J. Victor Lebacqz, Aeronautics Research Mission Directorate associate administrator, praised Shin for his accomplishments at Glenn and shared his excitement about working with him for the betterment of the entire Agency. Pictured, right, is Center Director Dr. Julian Earls, presenting an autographed print of the Center to Shin.

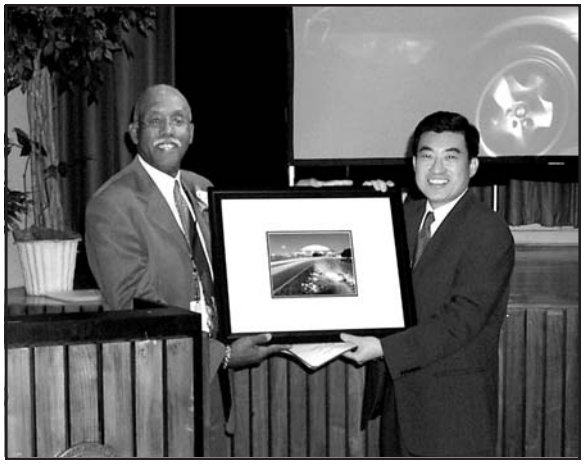


Photo by S. Jenise Veris

C-2004-1231 Photo by Quentin Schwinn

Cleveland Air Show

Glenn employees and exhibit staff at the annual Cleveland Air Show brought their full stock of resources and came ready to educate and celebrate over the Labor Day weekend. Nearly 40,000 participants visited NASA's tent and watched a video on the National Vision for Space Exploration. Visitors could also get a picture of themselves as astronauts and learn about the dynamics of flight and important work being done at Glenn. Pictured, right, is Kathy Zona, Ulta-Efficient Engine Technology Project Office, staffing a wind tunnel exhibit.

Ask the Director

Q: NASA Langley has just rolled out a plan to reduce Senior Executive Service staff, supervisory positions, and the number of buildings it maintains. Sean O'Keefe has praised their efforts. One of the stated goals is to reduce their overhead by 20 percent. What are we doing here at Glenn that is comparable to what has been accomplished at Langley? Who is responsible and what timeline are we working for?

A. (8/17/04) As you are aware, the Center is in the process of finalizing a complete reorganization. As a result of this effort, the Center will operate in a more efficient and effective manner. There is currently no plan to reduce the number of SES (Senior Executive Service) staff positions; the number of supervisory positions will be impacted as a result of the reorganization. Additionally, during the most recent Program Operating Plan cycle all organizations made significant efforts to reduce the amount of Center overhead. While Center senior management is responsible for planning and implementing operational strategy, it is the responsibility of every Glenn employee to support these efforts. The efforts underway at Langley Research Center are necessary for the health of that center; however, there is no one-size-fits-all solution at this Agency. The reorganization of our Center is the first step in our plan to remain a healthy and viable entity.

Q. Two detail opportunities for GS–13s were posted on *Today@Glenn*. It was stated that the positions would support the Center Director and Deputy Center Director to increase the effectiveness of communication and in implementing new initiatives. These appear to be redundant positions and only add to the Center overhead. Aren't the personnel in the Office of Strategic Management and the directorate offices tasked with communications and implementing initiatives? Aren't we continuing to increase the Center's overhead with these staffing actions?

A. (8/17/04) I firmly believe in developmental opportunities and I created these positions to be filled on a rotational basis for a period of 1 year. Since these positions are designed to provide broadening experiences for the individuals under the umbrella of "developmental opportunities," they are perfectly appropriate. I am encouraging employees to consider submitting applications. These positions are not redundant; rather they are one-of-a-kind opportunities with potential to assist the Office of the Director and the Center. ◆

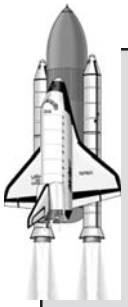
News Notes

LESA MEETING: LESA/IFPTE, Local 28, will hold its next monthly membership meeting on Wednesday, October 13, at noon in the Employee Center, .

JOINT ART EXHIBITION: The Cleveland Clinic Foundation (CCF) and NASA are hosting an art exhibition entitled "The Art of Science for Space" at the CCF Main Campus, H-Lobby and adjacent halls, including the Children's Hospital lobby, from October 7, 2004, to February 14, 2005. The exhibit includes NASA art, including NASA commissioned art, photographs, and graphics from collaborative research, models, and artifacts. An exhibit of space-themed Lego sculptures by Adrian Drake (ANLX) will be displayed in the Children's Hospital Lobby.

SATURDAY VISITOR CENTER EVENT: The Glenn Visitor Center (VC) will host "Chemistry in the Kitchen," in conjunction with National Chemistry Week, on Saturday, October 16, from 10 a.m. to 3 p.m. Dorothy Lukco, a surface analyst in the Research and Technology Directorate, will present hands-on demonstrations for students grades 2 to 6 at 11 a.m. and 1 p.m. The hour-long program will include chemical measurement, reactions, and results. Students will learn why bread rises, how iron gets into cereal, how to make spaghetti dance! Reservations are encouraged for the 11 a.m. and 1 p.m. presentations. The day will include special chemistry-related activities. For information and reservations, call 216–433–9653 or visit the VC Web site at http://visit.grc.nasa.gov/. In addition to this event, another hands-on activity based on the American Chemical Society's "Health and Wellness" theme will be held in the Administration Building Auditorium the following Saturday, Oct. 25. Watch for time and registration information on *Today @ Glenn*.

DISABILITY AWARENESS EVENT: Cleveland Signstage Theatre will perform DEAF (Dedication to the Elimination of Assumptions and Fallacies), a program that uses skits to explore many facets of nonverbal communication, including gesture, mime, and improvisation, to inform viewers about sign language, on Thursday, October 21 from 1:30 to 3 p.m. in the . Refreshments will follow in the DEB Cafeteria.



Return to Flight Symposium

Glenn will host a Return-to-Flight Symposium on Wednesday, October 20, in the DEB Auditorium to honor over 230 Glenn employees who have been directly involved in helping NASA return to shuttle flight. All Center employees will have an opportunity to learn about the work performed by their colleagues and tour facilities. Look for further details on *Today@Glenn*.

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Team achieves emissions testing milestone

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Researchers are currently analyzing this set of data and planning a special meeting in November to discuss the preliminary conclusions.

According to Dr. Chowen Wey, APEX project manager and environmental assessment manager for Glenn's Vehicle Systems Project Office, who led the coordination of the tests, "Never before have so many agencies teamed to examine emissions from so many angles. This is the first step needed to reach a complete understanding of particle emissions from commercial aircraft engines."

In recent years, fine particulate emissions from aircraft have become increasingly important because they are identified as potentially contributing to global climate change and lowering local air quality. Incomplete combustion of hydrocarbon fuel in gas turbine engines results in production of small particles comprising mostly solid carbon, known as soot, and nonvolatile organic compounds. Engine erosion and trace metal impurities in jet fuel also create metal particles that are emitted in the engine exhaust. Additionally, volatile aerosols of sulfur compounds and organics are formed as engine exhaust cools.

Project Manager Dr. Wey (woman in center, in light hat) discusses the day's test plans with APEX team members. Pictured far left is the assembly and probe stand that measures emissions data.

The international aviation community is interested in the potential effects of these emissions and it has specified measurement technology and identified possible limitations and controls. Regulatory agencies have likewise begun to examine methods for measuring particle emissions from aircraft gas turbine engines. "Current international regulations regarding visible smoke do not address and are not relevant to the measurement of particles responsible for health effects and environmental impact," said Wey.

APEX had two different sets of goals for the test: for NASA, it was to investigate the engine thrust's effect on particulate emissions. This was done by varying engine operating parameters. At the same time, the EPA used a landing-takeoff cycle defined by the International Civil Aviation Organization to simulate aircraft emissions at the airport. In addition, fuel effects on particulate emissions were explored by using three different fuels: baseline, high-sulfur, and high-aromatic.

Researchers at these institutions are taking part in collecting the data: NASA Glenn, Langley, and Dryden; General Electric Aircraft Engines, Evendale, OH; The Boeing Company, Seattle, WA; Southwest Research Institute, San Antonio, TX; Arnold Engineering Development Center, Arnold AFB, TN; University of Missouri, Rolla, MO; Aerodyne Research, Inc., Billerica, MA; EPA, Research Triangle Park, NC; Wright-Patterson Air Force Base, Dayton, OH; University of California, Riverside, CA; and Process Metrics, Inc., San Ramon, CA.

A majority of funding for these tests and analyses was provided by NASA's Vehicle Systems Program, whose goal is to pioneer and validate groundbreaking capabilities to protect the environment, make Americans more mobile, support national security, and enable new missions. Reduced noise and air pollution, as well as higher efficiency and completely new air vehicle concepts, are the key goals of the program. ◆

Glenn and CSU

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Dr. Timothy Tyburski, Glenn's International Space Station manager and CREATE manager, said that CREATE's mission in part is to help develop a competency in Northeast Ohio that supports NASA's mission, and in particular, Glenn.

"To spur satellite development, NASA suggested a CSU collaboration with the U.S. Air Force Academy, which requires cadets to design and build a small satellite," he said. "As CREATE matures, the ultimate goal is to have an entity that engages NASA, businesses, and universities, both locally and regionally, in building unsurpassed aerospace power competencies—a NASA Glenn partner that can compete with anyone."

A CREATE technical advisory board composed of individuals from the military, the National Science Foundation, and CSU faculty and Glenn staff will prepare the research agenda and assess the center's progress toward its objectives. ◆

NASA announces Software of the Year
Glenn named first runner-up

A data visualization and simulation software package used by Mars rovers and landers, and a software package that can be used in aerospace and industrial flow fluid applications, were chosen "best of the best" software developed by the Agency this year.

The "Science Activity Planner" (SAP), developed by a team at NASA's Jet Propulsion Laboratory, combines cutting-edge visualization with sophisticated planning and simulation capabilities to provide an intuitive interface to Mars. Mission scientists and engineers are currently using SAP to plan the next actions of the rovers and analyze the data arriving from Mars.

The TetrUSS 2004 is a suite of computer programs used for fluid dynamics and aerodynamics analysis. Originally developed for NASA internal applications by a team from NASA Langley, TetrUSS 2004 has evolved into an efficient and versatile computational fluid dynamics tool used by engineers and scientists throughout the Nation.

Glenn's TURBO–AE team was the first runner-up in NASA's Software of the Year competition, receiving an award of $25,000. TURBO–AE is a propulsion aeroelastic analysis code that models the dynamic interactions between the unsteady flow through turbomachinery blade rows and their elastic structure. This software predicts blade flutter and forced-response vibrations that can result in catastrophic blade failures in turbine engines.

"Catastrophic blade failure can lead to the loss of an engine or even the aircraft. Once encountered, such failures are not only costly to correct but also result in program delays, redesigns, and downtime for the entire fleet of engines," explained George Stefko, Structural Mechanics and Dynamics Branch chief, and TURBO–AE team member. "Therefore, it is critical to accurately predict these phenomena during the design and manufacture of turbomachinery." TURBO–AE is being used at Honeywell, GE, Williams, Siemens-Westinghouse, Air Force Propulsion Research Labs, the U.S. Navy, and many universities.

TURBO–AE Team members, pictured are, left, to right, standing, Stefko, VanZante, Shabbir, and Adamczyk; sitting, Bakhle and To.

The use of the TURBO–AE code can enable designers to be more aggressive in designing blades for safer, lighter, more efficient, and quieter engines. An efficient design results in reduced fuel consumption, thereby decreasing the CO_2 emissions and directly helping the environment. The increased efficiency and reduced weight also help reduce operating costs. Moreover, TURBO–AE enables the design of quieter engines by verifying in advance that bold new designs will not encounter aeroelastic vibration problems.

The Glenn TURBO–AE team members include Glenn's George Stefko, Dr. Milind Bakhle, Dr. Dale VanZante, Dr. John Adamczyk, Dr. Eric McFarland (retired), Dr. Theo Keith (Glenn and University of Toledo); Dr. Rakesh Srivastava and Dr. Aamir Shabbir (University of Toledo); Dr. Wai-Ming To (AP Solutions); Dr. Jen-Ping Chen and Dr. J. Mark Janus (Mississippi State University); Dr. John Barter (GE Aircraft Engines); and Dr. David Whitfield (University of Tennessee). The TURBO–AE team's work was supported by the Ultra-Efficient Engine Technology Project (Dr. Robert Shaw) and the Quiet Aircraft Technology Project (Dr. Joseph Grady). ◆

Disability Awareness Month spotlight

In recognition of Disability Awareness Month, employees were asked, "What law or legislation do you feel has made the most impact on improving the quality of life for people with disabilities?"

Aldrich

Suzanne Aldrich, Central Process Systems Engineering Branch. "The law that most impacts the quality of life for people with disabilities is the *Individuals with Disabilities Education Act*, a Federal law that requires states to provide a 'free, appropriate public education' to children with disabilities so that they can be educated to the greatest extent possible along with all other children. Qualifying children are entitled to special education related services at no cost to their parents."

Cotleur

Debra Cotleur, Office of Equal Opportunity Programs. "In the early 90s I saw curb cuts being put in on busy streets and ramps being built here at Glenn and wondered, what is prompting all of that? I hadn't heard of the American Disabilities Act, but now that I'm working in the Office of Equal Opportunity Programs as the Disability Program manager, all I can say is 'Wow, what a great law!' It allows people to get out of their homes and into the workplace. Picture getting to work if you are in a wheelchair and don't have curb cuts, community responsive transit, etc."

Diverse technologies touted in NASA-sponsored competition

NASA technologies and resources make a difference for U.S. companies in Glenn's region.

High-tech innovation spanning a wide range of markets and industries was rewarded during the 6th annual NASA Glenn Garrett Morgan Commercialization Initiative (GMCI) Assistance Awards ceremony held October 1. Eight U.S. companies were selected for their success in defining, developing, and commercializing new applications with NASA technologies or resources.

The 2004 winners and their share of the $400,000 award are cited below:

- **Advanced Bionics, Inc.** (Hopkins, MN), $65,000—for advancement of the Left Ventricular Assist Device system, a durable implantable artificial heart for cardiac support. Glenn technical monitor: John Sankovic, Fluid Physics and Transport Branch, for particle imaging velocimetry analysis of delicate fluid flow through pump.
- **EDAptive Computing, Inc.** (Dayton, OH), $45,000—to support marketing, planning, and promoting of EDAstar, an engineering tool for defense and aerospace. Technical monitor: NASA Ames through the Small Business Innovation Research Program
- **Epsilon Lambda Electronics, (ELE) Corporation** (Geneva, IL), $40,000—for evaluation and additional research on the reliability of microelectromechanical technology used in their two-dimensional electronically scanned antenna. Glenn technical monitor: George Ponchak, Electron Device Branch, for hardware design of ELE's scanning antenna.
- **Fields Process Technology, Inc.** (Cleveland, OH), $60,000—to stress-test their patented OZ Wall insulation panels used in the construction industry. Glenn technical monitor: David Stark, Facility Management & Planning Office, for wind tunnel testing.
- **Phoenix International, Ltd. V** (Brookfield, WI), $50,000—for development of prototypes for new retain-release pin shear design, purchase of tooling and dies, and promotion of their Magnum Spike, a tire deflation device product line. Glenn technical monitors: Chip Redding and Bob Puzak, Engineering Development Division, and ZIN Technologies for mechanical design of clip and testing at Plum Brook Station.
- **TLC Precision Wafer Technology, Inc.** (Minneapolis, MN), $40,000—to support high-volume production and manufacturing of their metamorphic integrated transceiver chip technology for use in automated control electronics, advanced communications surveillance, and other applications. Glenn technical monitor: George Ponchak for advanced testing of TLC's antenna.
- **WebCore Technologies, Inc.,** (Dayton, OH), $50,000—to upgrade marketing materials for visibility and recognition of their TYCOR™ fiber-reinforced foam composite technology. Glenn technical monitor: Dale Hopkins, Structural Mechanics and Dynamics Branch, for ballistic impact testing.
- **Women on Wheels, Inc.** (Cleveland, OH), $50,000—to advance their (super) sonic washing apparatus and technology (SWAT) nozzle used for pressure-washing trucks and other large surfaces. Glenn technical monitor: Al Johns, Nozzle Branch, for nozzle pin calibration testing in Glenn's Icing Research Tunnel.

GMCI increases the competitiveness of small business, with an emphasis on minority-owned and woman-owned firms, in the Great Lakes and Northeast regions of the United States by providing enhanced access to NASA technology, programs, and expertise. ◆

THE NASA GLENN GARRETT MORGAN Commercialization Initiative

CFC reaches out in 2004

Each year Federal employees and military personnel raise millions of dollars for nonprofit charities through the Combined Federal Campaign (CFC). Last year, the NASA family at Glenn donated $400,400 to meet the needs of others—locally, nationally, and around the world.

This year's CFC theme is "Time Never Runs Out for Caring." The campaign runs through October 22 and hopes to raise $370,000.

The CFC is a convenient way for Federal employees to support organizations that make a difference and improve the quality of life in their hometown, in their state, across the country, and internationally. Whatever is important to you, there is an organization that shares your passion—working with children, providing shelter to the disadvantaged, assisting the elderly, and protecting the environment. Each organization included meets the Office of Personnel Management guidelines for the CFC.

CFC enables people to contribute to specific organizations with very little financial impact. Even a small contribution will make a great difference.

This year it is more convenient than ever to give. Simply visit the CFC Web site by typing CFC into the transport box of the Glenn home page. There you will find information on this year's campaign, a searchable Contributor's Guide, and instructions on how to donate.

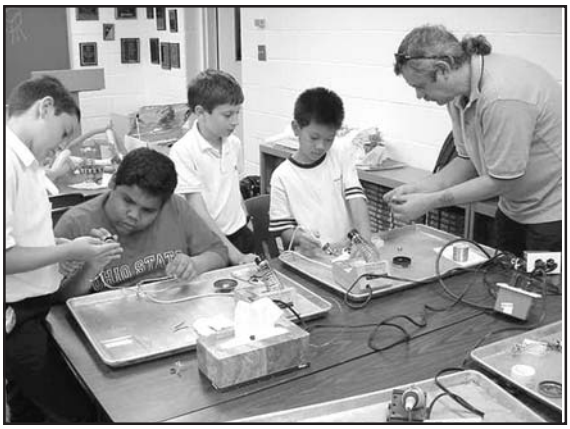
Please take the time to view the Contributor's Guide and determine the charitable organization or organizations to which you wish to donate. Through designation, you ensure that your donation goes to meet those needs that you feel are most important.

—Lesley Janosik
2004 Glenn CFC chairperson

Extended care programs introduce aerospace careers

Civil servants and support service contractors stay after school to share the joys of technology.

BY DOREEN B. ZUDELL



Redding gives instructions on assembling electronic components to Incarnate Word Academy students during an after-school science session.

This fall, a group of Glenn volunteers is conducting after-school science clubs for fourth- and fifth-grade students at Kentucky Elementary School in Cleveland and Incarnate Word Academy in Parma Heights in an effort to inspire students to learn about math and science.

"There's nothing better than getting your hands into something and seeing how it works," Chip Redding, Engineering Development Division, explained. "The failures and the successes are all part of the learning process."

Redding was instrumental in designing a curriculum for this year's program, and is among the team of about a dozen helping to coordinate and implement the science club. Redding also has the support of his division, which is providing soldering stations and premade circuit boards for students.

"People who are in aerospace careers can help develop the next generation of explorers," project coordinator Anthony Miranda, technical director of Glenn's onsite contractor Alphaport, Inc., said. "Our hands-on curriculum features real-world scenarios that excite and motivate the students to learn more about space-related math and science."

Working with area schools since 2000, Miranda and other Glenn civil servants and support service contractors have introduced such topics as living and working in space, launching rockets, and designing and building robotics. The 90-minute programs, which run one afternoon a week during extended care hours, challenge students at different levels of development. Ideally, elementary school students could start as beginners and become mentors themselves when they get older.

The support and valuable resources of the Engineering Development Division, the Visitor Center, and other Center participants have contributed greatly to the popularity of the science club. Through the program, students also have found opportunities to pair up with NASA mentors, such as when they need help with science fair projects.

"The extended-care science club program is a win-win situation," Miranda said. "Students are experiencing exciting opportunities to learn about space-related science and engineering and the aerospace industry is developing its future workforce."

Onsite contractors involved in the science clubs include Alphaport, Inc., Northrop Grumman, and QSS Group, Inc. Glenn's LESA/IFPTE Local 28 union has recently committed its support to the science club project as well. ◆

Cafeteria improvement project

Despite significant labor reductions and other cost-cutting measures, the NASA Glenn Exchange—and thus Glenn's two cafeterias, which are its main sources of revenue—is nearly insolvent. Early this summer, Center Director Dr. Julian Earls appointed Mark Kilkenny, Systems Management Office, and Exchange Manager Mark Betlejewski to set up a team to find ways to stave off its collapse.

The team members assembled to address cafeteria concerns include Tom Burke, Systems Engineering Division, LESA union representative; Cindy Martin, Exchange employee; Anita Arnold, Office of Human Resources; Sally Saltzman, Accounting and Reports Branch, Glenn Exchange treasurer; Kirk Seablom, Systems Management Office, a cafeteria user; and Katherine Martin, Community and Media Relations Office, a cafeteria nonuser.

In August, the team selected two contracts for awards—one to KJT Consulting and another to Emmaus Consulting, two independent food service experts—to analyze and inspect both cafeterias, then report their findings and recommendations for restoring them to profitability. In addition, at the consultants' request, the team conducted a cafeteria user, and nonuser, survey to gain feedback on what Glenn civil servant and contractor employees expect from the cafeterias.

The findings of the consultants, along with the team's analysis and recommendations, were recently presented to the Center Director and the Director's Leadership Team (DLT) for a decision. Status reports on the project will continue to be sent to the DLT and posted along with the survey results on *Today@Glenn* as key milestones and decisions are reached. ◆

People


Dr. Acosta


Dr. Gabb


Dr. MacKay


Dr. Niederhaus

Awards

Dr. Roberto Acosta, Communications Division, is among the First Annual Luminary Honorees selected by the Hispanic Engineer National Achievement Awards Corporation (HENAAC) to be honored during the 16th Annual HENAAC Conference held from October 7 to 9 in Pasadena, CA. Luminaries represent top Hispanic professionals in engineering, science, and technology who have made significant contributions to the Hispanic technical community. Acosta is recognized for his mentorship and leadership in research advancing satellite technology.

"Case Studies of Fatigue Life Improvement Using Low Plasticity Burnishing in Gas Turbine Engine Applications," was selected Best Paper by the Manufacturing Materials & Metallurgy Committee from the American Society of Mechanical Engineers and the International Gas Turbine Institute. The paper, coauthored by Paul S. Prevy, Ravi Ravindranath, and Michael Shepard of Lambda Research, and **Dr. Timothy Gabb** of Glenn's Advanced Metallics Branch, was based on work supported by NASA's Aviation Safety Program and Glenn's Small Business Innovation Research Program to develop and scale up the low plasticity burnishing metallic surface enhancement process used to mitigate corrosion.

Dr. Rebecca MacKay, Materials Division, is the recipient of the Outstanding Achievement Award presented by Women In Aerospace, a nonprofit organization dedicated to promoting the achievements and advancement of women in aerospace and related careers. Mackay was recognized for her world-renown expertise in advanced high-temperature superalloy materials for aircraft and rocket propulsion systems. She and two NASA colleagues (Estelle Condon from Ames, who received the Lifetime Achievement Award, and Anne Thompson from Goddard, who received the International Achievement Award), were among six women honored for making significant contributions in aerospace during a reception held September 21 on Capitol Hill. Information on Mackay is available at http://www.womeninaerospace.org/04mackay.htm.

Carlos Morrison, Structural Mechanics and Dynamics Branch, will receive the Technologist of the Year Award, one of six award categories honored at the upcoming "Technical Achiever Awards" banquet of the National Technical Association's (NTA) 76th Annual Conference. Morrison was recognized for his advancement of the bearingless switched-reluctance motor. He also invented the Morrison motor, a hybrid motor that functions as both a magnetic bearing and a motor, and is best suited for use in a location of varied temperatures and/or other extreme conditions that exclude the use of conventional electric motors and mechanical bearings. NTA is the premiere technical organization of African-American scientists, engineers, architects, technologists, educators, and technical business entrepreneurs.

Dr. Charles Niederhaus, Microgravity Fluid Physics Branch, received NASA's Exceptional Achievement Medal during Johnson Space Flight Center's NASA Honor Award ceremony on August 17. Niederhaus was honored "for significant contributions to the design of the NASA Space Hydrodynamic Focusing Bioreactor System to support cell culture and tissue engineering investigations about the space shuttle or in the Biotechnology Facility on space station."

Retirements


Everett

Ronald Everett, Procurement Division, retired on January 3, 2004, with 39 years of NASA service.

Robert Reminder, II, Engineering Development Division, retired on May 31, 2004, with 30 years of NASA service.

Charles Barrett, Materials Division, retired on August 31, 2004, with 48 years of NASA service.

Joseph Balombin, Microgravity Science Division, retired on September 30, 2004, with 39 years of NASA service.

AeroSpace Frontiers is an official publication of Glenn Research Center, National Aeronautics and Space Administration. It is published the first Friday of each month by the Community and Media Relations Office in the interest of the Glenn workforce, retirees, Government officials, business leaders, and the general public. Its circulation is approximately 6700.

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DEADLINES: News items and brief announcements for publication in the November issue must be received by noon, October 15. The deadline for the December issue is noon, November 10. Submit contributions to the editor via e-mail, doreen.zudell@grc.nasa.gov, fax 216–433–8143, phone 216–433–5317 or 216–433–2888, or MS 3–11. Ideas for news stories are welcome but will be published as space allows. View us online at http://AeroSpaceFrontiers.grc.nasa.gov.

WINNER
2004 APEX AWARDS FOR PUBLICATION EXCELLENCE

News Notes

Continued from page 5

AFGE MEETING: AFGE Local 2182 will hold its next monthly membership meeting on Wednesday, November 3, at 5 p.m., at Denny's Restaurant, 25912 Lorain Road, North Olmsted. All members are encouraged to attend.

NATIVE AMERICAN OBSERVANCE–VETERANS AWARENESS PROGRAM: Keith Little, a U.S. Marine Corps Navajo Code Talker, will be the keynote speaker for two events on Wednesday, November 10, in the . As part of the Native American Month Observance program, Little, a member of the Navajo Nation from Cyrstal, NM, will speak from 10 to noon, on the theme, "Expanding the Circle." From 1 to 2 p.m., he will speak at the National Veterans Awareness Recognition Ceremony on serving as a WWII Code Talker.

In Memory

Captain Byron Batthauer, USNR, 74, who retired as chief pilot of Flight Operations in 1994 with 35 years of Federal service, recently died. Batthauer was the recipient of NASA's Exceptional Service Medal for improvements to research, productivity, and safe operation of the Center's Flight Operations. He was a member of the Advanced Turboprop Project Team that received the Collier Aviation Trophy, considered the most prized American aeronautical award in 1987. During his career as an aerospace researcher and test pilot at NASA, flight checkouts were earned in more than 40 different aircraft with over 20,000 hours of logged flight time. Batthauer was inducted into the Society of Experimental Test Pilots, an organization of approximately 2000 members from 30 countries. Throughout his career at NASA, he also maintained a commitment of service to the U.S. Naval Reserve.

Batthauer

Behind the Badge

a closer look at our colleagues

Greg Zimmerli

Zimmerli with one of his hefty pumpkins. This one doubled as a jack-o-lantern.

Job Assignment: I'm a biophysicist working on the bone loss problem experienced by astronauts in microgravity. I recently moved from Microgravity Fluid Physics to the new Bioscience and Technology Branch.

Time at NASA: I've been here 12 years—4 years as a NASA civil servant, and 8 years with various support service contractors.

Describe your family: I have a wonderful, beautiful wife, Lynnette. We've been married 5 years and live in Brunswick Hills. We have two adorable daughters, Nicole, 3, and Sarah, 2.

Dream job: Science Advisor to the President of the United States

Advice for the President of the United States: Increase funding to NASA scientists and the National Science Foundation.

Hobbies/interests outside of NASA: I like growing giant pumpkins. It's intense and it's extreme. There is a special variety of seed that has been bred to yield big pumpkins, and you also need good soil and many hours of work every week. It's not a leisure activity. The growing season is 6 months long, and there's a lot that can go wrong at any time. It's very exciting to see a fruit growing 25+ pounds a day, but it's no time for summer vacation. My personal best was last year at 666.5 pounds, and this year I'm hoping to break 700. Last year I placed 18th at a local regional weigh-off. First place weighed 1370 pounds, which was a world record for about 4 hours, until one on the west coast weighed in a few pounds heavier.

Philosophy to live by: Do unto others as you would have others do unto you.

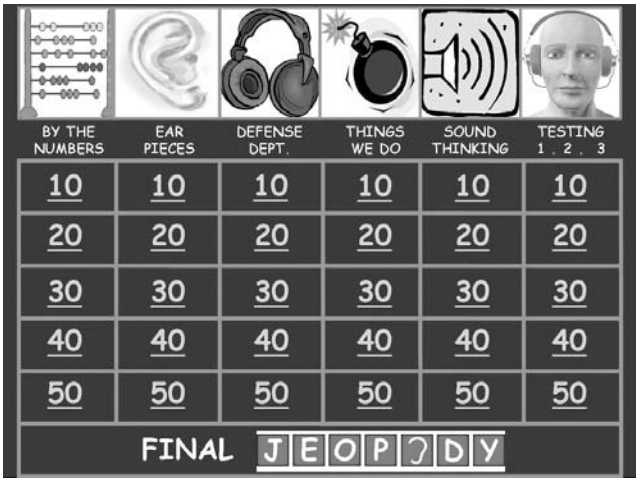
Person you most admire: Jesus. If you admire anyone or anything more than him, you're probably going to take some heat for it sooner or later.

Emley, Jr.

Warren "Ned" Emley, Jr., 88, who retired in 1974 after 35 years of Federal service, recently died. Emley was a mechanical engineer involved in concept, design, and construction of several NASA ground test facilities for flight propulsion systems, including wind tunnels and rocket stands in Ohio, Nevada, and California.

Martin Braun, 88, who retired after 23 years of Federal service, recently died. He served as an engineer in Technical Management Systems prior to his retirement in 1986.

Glenn produces multimedia training resource to save hearing



What is 90 decibels? Give me ear pieces for 30, please!

To support employee education in occupational hearing conservation, Glenn's Acoustical Testing Laboratory (ATL) has produced *JeopEARdy*, an interactive multimedia training resource that emulates the familiar Jeopardy game.

JeopEARdy is presented in an easy-to-use Microsoft PowerPoint format (accompanied by additional linked files containing sounds, videos, and other resources). The game's graphic interface utilizes the *JeopEARdy* grid with six topics and five answers under each topic with values of 10 to 50. There is also a Final JeopEARdy question. The game may be played in its ready-to-use form or may be customized to meet the specific needs of the audience and instructor. The *JeopEARdy* CD also contains tutorials on selected technical topics related to developing multimedia PowerPoint shows.

Beth Cooper, Glenn's ATL manager, collaborated with Dr. Dick Danielson of NASA Johnson's Audiology and Hearing Conservation Clinic, to create *JeopEARdy* as a training resource that could also serve as a vehicle for demonstrating the advanced PowerPoint techniques that can greatly enhance hearing conservation training.

"Members of Glenn's Imaging Technology Center were heavily involved in producing *JeopEARdy*, and Glenn summer intern Nick Hawes from the Cleveland Institute of Art created the *JeopEARdy* logo and some of the other illustrations that appear in the *JeopEARdy* game," Cooper said. "Most of the photographs in the game are of Glenn employees, including a band that appears in one of the video clips."

For information about *JeopEARdy* or other educational outreach products developed and distributed by the Glenn ATL, please visit the ATL Web site at http://acousticaltest.grc.nasa.gov. ◆

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